DO NOT ENTER: /J.L./

IN THE CLAIMS:

Please amend the claims as follows: 08/02/2010

1-33. (Canceled)

34. (Currently Amended) An encoded micron-sized semiconductor or insulator particle having an integral and ordered physical multi-layer porosity structure with multiple porosity interfaces between consecutive multiple porosity layers, the multiple porosity layers having multiple optical thicknesses, wherein the physical multi-layer structure is configured to produce an optical signature in the form of an interference pattern in the reflectivity spectrum that uniquely corresponds to a single particular etching a code from a library of codes that was used to create the particle via a computer waveform controlled etch. ~~embedded in its physical structure by refractive index changes between different regions of the particle~~.

35. (Canceled).

36. (Canceled)

37. (Currently Amended) The particle of claim 34, further comprising a receptor within the pores of the physical multi-layer porosity structure.

38. (Original) The particle of claim 37, wherein said receptor is a receptor for a biological analyte.

39. (Original) The particle of claim 37, wherein said receptor is a receptor for

a chemical analyte.

40. (Original) The particle of claim 37, wherein said receptor is a receptor for a gaseous analyte.

41. (Currently Amended) The particle of claim 37, further comprising a fluorescence tag within the pores of the particle for assaying the particle

42. (Original) The particle of claim 34, wherein the thin film comprises porous silicon.

43. (Canceled).

44. (Canceled).

45. (Currently Amended) A library of optically encoded particles, comprising a plurality of particles of claim 35, each individual particle has a unique integral and ordered physical multi-layer porosity structure with multiple porosity interfaces between consecutive multiple porosity layers, the multiple porosity layers having multiple optical thicknesses, wherein the physical multi-layer structure is configured to produce an optical signature in the form of an interference pattern in the reflectivity spectrum that uniquely corresponds to a single particular etching a code from a library of codes that was used to create the particle via a computer waveform controlled etch ~~having a unique porosity whose optical reflectivity spectrum can be recognized as a distinct interference pattern from one of a library of patterns for the purposes of distinct identification of each particle from all other ones of the plurality of particles and for identification of a spectral shift in the presence of an analyte~~.